

WHAT IS CLAIMED IS:

1. A method for forming a two-dimensional array of Lead-Salt detector elements monolithically on an integrated circuit, the method comprising:
 - 5 providing an integrated circuit having a passivation layer covering a plurality of electrical contacts;
 - depositing a Lead-Salt layer upon the passivation layer, the Lead-Salt layer having a first surface adjacent the passivation layer and a second surface opposite the first surface;
 - 10 delineating the Lead-Salt layer into a plurality of detector elements;
 - creating vias through the passivation layer to the electrical contacts;
 - forming electrical couplings between the electrical contacts and the detector elements; and
 - sensitizing the Lead-Salt layer.
- 15 2. The method of Claim 1, wherein the passivation layer comprises Silicon Dioxide.
3. The method of Claim 1, wherein the electrical couplings comprise Gold.
- 20 4. The method of Claim 1, wherein the pitch of the detector elements is less than approximately thirty microns.

5. The method of Claim 1, further comprising:

depositing a conductive material upon the passivation layer before depositing the Lead-Salt layer; and

5 patterning the conductive material to form a plurality of detector element contacts and a common grid for the detector elements;

wherein forming electrical couplings between the electrical contacts and the detector elements comprises producing electrical couplers between the electrical contacts and the detector element contacts.

10 6. The method of Claim 5, wherein the conductive material comprises Titanium-Gold.

15 7. The method of Claim 5, wherein the electrical couplers couple the electrical contacts to the detector element contacts by overlaying at least part of the detector element contacts.

8. The method of Claim 5, wherein the electrical couplers couples the electrical contacts to the detector elements by overlaying at least part of the detector element contacts and at least part of the second surface of the detector elements.

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9. The method of Claim 1, wherein forming electrical couplers between the electrical contacts and the detector elements comprises producing electrical coupler between the electrical contacts and at least part of the second surface of the detector elements.

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10. The method of Claim 1, wherein the Lead-Salt comprises Lead Selenide.

30 11. The method of Claim 1, further comprising texturing the passivation layer before depositing the Lead-Salt layer.

12. The method of Claim 11, wherein texturing the passivation layer comprises ion milling the passivation layer.

13. The method of Claim 1, further comprising applying a textured coating
5 to the passivation layer before depositing the Lead-Salt layer.

14. The method of Claim 1, further comprising depositing a passivation layer over the Lead-Salt layer.

15. A two-dimensional array of Lead-Salt detector elements monolithically formed on an integrated circuit, the system comprising:

an integrated circuit comprising a passivation layer and a plurality of electrical contacts, the passivation layer having vias to the electrical contacts;

5 a delineated, sensitized Lead-Salt layer formed upon the passivation layer, the delineations forming a plurality of detector elements; and

electrical couplers formed between the electrical contacts and the detector elements.

10 16. The system of Claim 15, wherein the passivation layer comprises Silicon Dioxide.

17. The system of Claim 15, wherein the electrical couplers comprise Gold.

15 18. The system of Claim 15, wherein the pitch of the detector elements is less than approximately thirty microns.

19. The system of Claim 15, further comprising a conductive material
20 upon the passivation layer and underlying part of the Lead-Salt layer, the conductive material forming a plurality of detector element contacts and a common grid for the detector elements, wherein the electrical couplers between the electrical contacts and the detector elements comprise electrical couplers between the electrical contacts and the detector element contacts.

25 20. The system of Claim 19, wherein the conductive material comprises Titanium-Gold.

30 21. The system of Claim 19, wherein the electrical couplers overlay at least part of the detector element contacts.

22. The system of Claim 19, wherein the electrical couplers overlay at least part of the detector element contacts and the detector elements.
23. The system of Claim 15, wherein the electrical couplers overlay at least part of the detector elements.
24. The system of Claim 15, wherein the Lead-Salt comprises Lead Selenide.
- 10 25. The system of Claim 15, wherein the passivation layer is texturized.
26. The system of Claim 15, further comprising a textured coating between the passivation layer and the Lead-Salt layer.
- 15 27. The system of Claim 15, further comprising a passivation layer over the Lead-Salt layer.

28. A two-dimensional array of Lead-Salt detector elements monolithically mounted on an integrated circuit, the system comprising:
- an integrated circuit comprising a passivation layer covering a plurality of electrical contacts, the passivation layer having vias to the electrical contacts;;
- 5 a conductive material upon the passivation layer, the conductive material forming a plurality of detector element contacts and a common grid for the detector;
- a delineated, sensitized Lead-Sulfide layer formed upon the passivation layer and part of the conductive material, the delineations forming a plurality of detector elements having a pitch of less than approximately thirty microns; and
- 10 electrical couplers formed between the electrical contacts and the detector element contacts.

29. The system of Claim 28, wherein the electrical couplers overlay the detector element contacts and the detector elements.

30. A two-dimensional array of Lead-Salt detector elements monolithically mounted on an integrated circuit, the system comprising:

an integrated circuit comprising a passivation layer covering a plurality of electrical contacts, the passivation layer having vias to the electrical contacts;

5 a textured coating upon the passivation layer;

a delineated, sensitized Lead-Selenide layer formed upon the textured coating, the delineations forming a plurality of detector elements having a pitch of less than approximately thirty microns; and

10 electrical couplers formed between the electrical contacts and the detector elements.

31. An infrared sensor comprising:
- optics; and
- a two-dimensional array of Lead-Salt detector elements monolithically formed on an integrated circuit, the system comprising:
- 5 an integrated circuit comprising a passivation layer and a plurality of electrical contacts, the passivation layer having vias to the electrical contacts;
- a delineated, sensitized Lead-Salt layer upon the passivation layer, the delineations forming a plurality of detector elements; and
- electrical couplers between the electrical contacts and the detector
- 10 elements.